MICHIGAN

FOREST PEST DETECTION PROGRAM

REPORT FOR 1953

COOPERATORS

DIVISION OF FOREST ENTOMOLOGY, LAKE STATES FOREST EXPERIMENT STATION

BUREAU OF PLANT INDUSTRY, STATE DEPARTMENT OF AGRICULTURE

DEPARTMENTS OF ENTOMOLOGY, BOTANY AND PLANT PATHOLOGY,
FORESTRY EXTENSION SERVICE, MICHIGAN STATE COLLEGE

SCHOOL OF NATURAL RESOURCES, UNIVERSITY OF MICHIGAN

PRIVATE FOREST INDUSTRY

FORESTRY DIVISION, MICHIGAN DEPARTMENT OF CONSERVATION

MICHIGAN FOREST PEST DETECTION PROGRAM

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INTRODUCTION

The Michigan Forest Pest Detection Program was organized in the spring of 1950 through the cooperative efforts of several state and federal agencies, and private industry. The goal of this program is a coordinated approach to the problem of forest insects and diseases on a statewide basis, employing the facilities of these various agencies, each contributing in its respective field.

The program, now in its fourth year, is approaching the functions for which it was designed. The consequent influx of information on forest pests throughout the state, in addition to providing valuable data for forest protection, has made possible the close cooperation with other public and industrial organizations in the Lake States faced with mutual problems.

The need for more far-reaching cooperative efforts and closer liason between corresponding agencies in the Great Lakes region has led to the formation of the Central International Forest Insect and Disease Conference. This group, composed of entomologists, pathologists, and foresters throughout the region, had its first meeting in St. Paul, Minnesota, in January with another similar meeting being held in Sault Ste. Marie, Ontario, in October.

In Michigan, as well as throughout the nation, private industry has shown increasing interest in the problems of insect and disease control. The William Bonifas Lumber Company of Iron Mountain has established its own insect and disease laboratory and has employed a forest entomologist and a forest pathologist. Excellent cooperation has been received from this company through surveys and reports. Other companies in the state are interested in participating in pest detection work, and an effort will be made to utilize their personnel and lands wherever possible to augment the program.

The following report of the activities of the Forest Pest Detection Program for 1953 was compiled by the Forestry Division of the Michigan Conservation Department.

* * *

1953 ACTIVITIES

MEETINGS

EAST LANSING

A meeting to discuss the forest insect situation in Michigan was held at Michigan State College on January 29. Representatives of the cooperating agencies in the Forest Pest Detion Program were in attendance.

Mr. Richard C. Fox, acting as chairman, directed discussion around the following topics:

(A) Insect observation reports.

1. Summary of reports received in 1952.
2. Reporting problems and procedures.
3. Changes in report forms.

(B) Forest tent caterpillar situation.

1. Special survey summaries.
2. Publicity campaign for 1953.

(C) Reports on other critical insects.

(D) Plans for 1953.

MILWAUKEE*

The third annual Lake States forest insect survey conference was held in Milwaukee on February 18. Representatives of federal, state, and private agencies concerned with protecting forest resources from insect damage participated in the discussions.

Dr. H. J. MacAloney, general chairman of the meeting, conducted discussion around the following schedule:

1. Review of 1952 Surveys - Minnesota, Wisconsin, Michigan, Illinois, Federal.
   Discussion Leader - H. J. MacAloney.
2. Panel on Cooperative Efforts - Publicity, Reports, Coordination.
   Discussion Leader - J. W. Butcher.
3. Panel on Improvement in Survey Techniques.
   Discussion Leader - D. M. Benjamin.

The showing of two motion pictures, "The Battle of the Beetles", concerning the use of penetrating sprays to control the Engelmann spruce beetle in Colorado, and "The Spruce Budworm", depicting airplane spraying with DDT in Oregon, made an interesting break midway in the discussions.

LANSING

A second meeting of the cooperators in the Michigan Forest Pest Detection Program was held in December for the purpose of discussing the 1953 surveys and insect conditions. The discussion schedule and attendance was similar to that outlined above for the East Lansing meeting.

* NOTES WERE TAKEN FROM A DIGEST OF THE MEETING PREPARED BY THE MILWAUKEE FOREST INSECT LABORATORY AND CIRCULATED TO ALL PARTICIPANTS.

SPECIAL SURVEYS

FOREST TENT CATERPILLAR

The outbreak of the forest tent caterpillar continued much as was predicted. Hatching of the larvae began during the week of May 4-9 in both peninsulas with caterpillar development proceeding normally except in eastern Presque Isle county where heavy larval starvation was observed. During the first two weeks in June, the parasitic fly (*Sarcophaga aldrichi*, Parker) began to appear in great numbers. By the end of the third week in June, their numbers became very disagreeable, particularly in recreation areas in Cheboygan and Presque Isle counties.

On June 17-21 the infestation areas were traversed by automobile and on June 22, an aerial survey, using a Conservation Department plane, was made to map the defoliated areas in both peninsulas (see Map I). Another short flight was made on June 29 to map the defoliated areas in southern Dickinson county. In general, defoliation in the eastern end of the Upper Peninsula was much less than in 1952. The other outbreaks in the Upper Peninsula increased to some extent, especially in Dickinson county. The Lower Peninsula outbreak increased in intensity, much as was expected, with the exception of the hard maple infestation in Otsego county where only very light defoliation occurred.

During the week of July 6-10, collections of forest tent caterpillar cocoons were made throughout the outbreak areas of both peninsulas. Several additional collections were taken over 1952 to obtain better sampling coverage of the enlarged defoliated areas in the Lower Peninsula and to the west of the main outbreak area in the Upper Peninsula. Forty-six points were visited and a total of 1,366 cocoons were collected.

Paul R. Flink, entomologist for the William Bonifas Lumber Company, made the collections in Dickinson county and Herbert Ewan, of the Milwaukee Forest Laboratory, assisted in making the collections in the Newberry-Seney-Shingleton areas. The remainder of the collections were made by Forestry Division personnel.

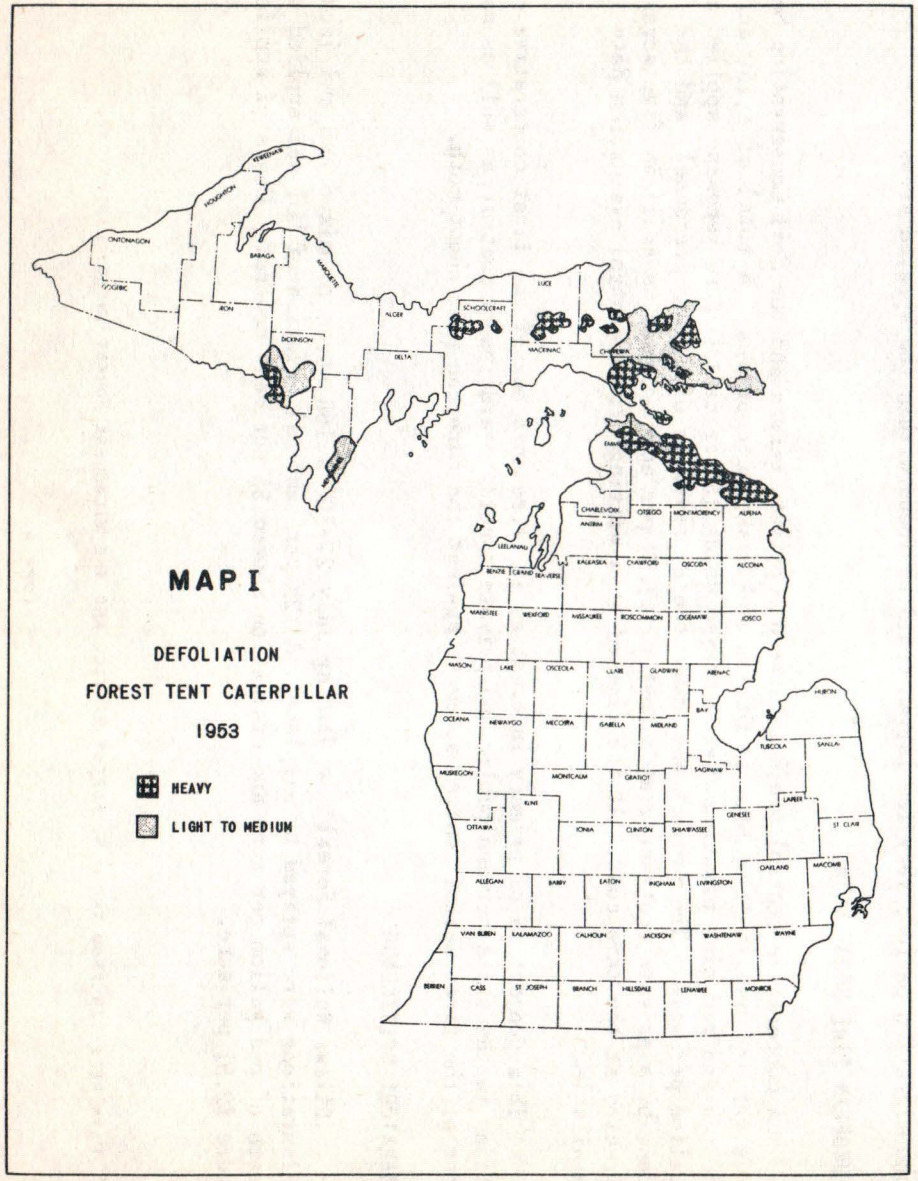
After collection, the cocoons were kept in a constant temperature room until well after moth emergence was completed. Each cocoon was then opened to determine the condition of its contents.

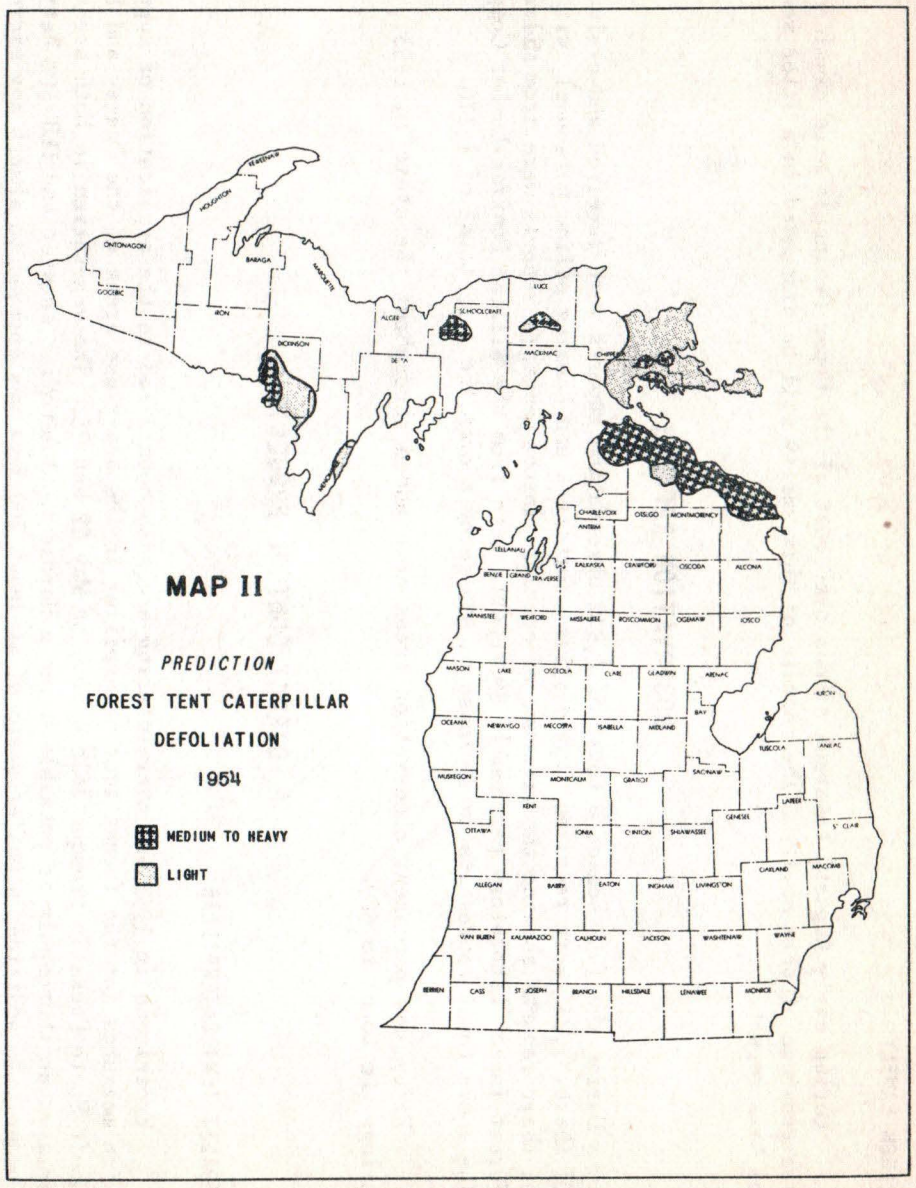
This examination showed a mean cocoon mortality of 89.2 per cent for the Upper Peninsula outbreaks and a mean of 84.2 per cent for the Lower Peninsula outbreak.

An egg mass survey was carried out by several agencies during the fall to determine the approximate population densities in the infested areas in 1954. Collections on state and private lands within the boundaries of the Munuscong, Mackinac, Grand Sable, and Sturgeon River State Forests in the Upper Peninsula, and the Hardwood and Black Lake State Forests in the Lower Peninsula were made by Forestry Division personnel. Those made within the boundaries of the Marquette National Forest were made by Ranger Elliot and Acting Ranger Tardiff while counts on certain private lands in Chippewa, Mackinac, Dickinson, and Menominee counties were made by Paul R. Flink. Map II shows the areas in which defoliation can be expected during the spring of 1954.

JACK PINE BUDWORM

At intervals during April, May and June, northern Luce county was surveyed for the presence of the jack pine budworm. This survey detected the insect in outbreak stages on well over 6,000 acres of jack pine stands of various age classes and stocking densities.


MAP I
DEFOLIATION
FOREST TENT CATERPILLAR
1953
HEAVY
LIGHT TO MEDIUM


MAP II
PREDICTION
FOREST TENT CATERPILLAR
DEFOLIATION
1954
MEDIUM TO HEAVY
LIGHT

LARCH SAWFLY

During early August, tamarack stands over most of the Upper Peninsula were examined for the presence of this sawfly. The results of this survey will be discussed in a later section of this report.

OBSERVATION REPORTS

During the 1953 season a total of 1,942 observation reports were received and evaluated. Of these, 1,843 were received from district foresters and Lansing office personnel, with 43% of their reports showing the presence of specific insect pests; 60 reports were from Milwaukee Forest Insect Laboratory personnel; 39 reports were from the William Bonifas Lumber Company. The above total represents an increase of 572 reports over the 1952 total of 1,370.

Fifty new permanent observation areas were added throughout the state in 1953. This brings the total to 609.

DIRECT CONTROL PROJECTS

FOREST TENT CATERPILLAR

Experience in 1952 and overwintering egg mass counts led to the application of suppression measures for the forest tent caterpillar in the heavy use areas of the Onaway and P. H. Hoeft State Parks in Presque Isle county on May 22 and 25. The vegetation in both areas was sprayed as thoroughly as possible using a Hardie L-40 AeroMist sprayer and DDT 50% Wettable Powder. In addition, a buffer strip of at least 200 feet was sprayed to absorb any migrating caterpillars. No actual population counts were made but no defoliation was evident and during the migration period, very few larvae could be found within the sprayed areas.

EUROPEAN PINE SHOOT MOTH

A cooperative control project between 23 private owners and the Soil Conservation Service was carried out in late June in Ottawa and Muskegon counties. A total of 1,150 acres of Scotch and red pine plantings were sprayed using 15 per cent DDT in kerosene applied at one gallon per acre. The project was under the supervision of S.C.S. personnel, and the flying done by a private contractor at a cost of $2.80 per acre. Areas as small as five acres were treated at the same cost. At the time of this writing, final control evaluation data is not available.

This project is of primary interest as it represents one of the first cooperative operations in the state between public and private owners toward insect control, as well as marking one of the first aerial control attempts against the European pine shoot moth.

SARATOGA SPITTLEBUG

Ottawa National Forest* - During July 27-30, 2,168 acres of mixed red and jack pine plantations were sprayed by airplane. A 12½ per cent oil solution of DDT was applied at the rate of one gallon per acre and evaluation showed 85 per cent control. Costs of application were $2.51 per acre.

* DATA RECEIVED FROM THE U.S. FOREST SERVICE AND THE MILWAUKEE FOREST INSECT LABORATORY.

Hiawatha National Forest* - On July 28 and 29, 1,028 acres of red and jack plantations were sprayed by air for control of the Saratoga spittlebug. A 12½ per cent DDT oil solution was applied at the rate of one gallon per acre. Evaluation showed 98 per cent control. Cost of application was $1.50 per acre.

SUMMARY OF PEST CONDITIONS

CRITICAL INSECTS

JACK PINE BUDWORM - (*Choristoneura pinus,* Free)

Total 232 reports -

75 positive reports
16 showed heavy defoliation
9 showed moderate defoliation
50 showed light defoliation

Populations of the jack pine budworm declined noticeably in some sections of the northern half of the Lower Peninsula, notably in Roscommon, Ogemaw, Crawford, Kalkaska, and Grand Traverse counties. However, defoliation continued to be heavy in Montmorency and Presque Isle counties. The outbreak in northern Luce county in the Upper Peninsula, detected late in 1952, increased to serious proportions with heavy defoliation apparent on over 4,000 acres. In addition, a new outbreak was detected in western Chippewa county in the Marquette National Forest. The infestation in Delta county persisted at a low population level. (See Map III.)

REDHEADED PINE SAWFLY - (*Neodiprion lecontei,* Fitch)

Total 238 reports -

21 positive reports
5 showed heavy defoliation
11 showed moderate defoliation
5 showed light defoliation

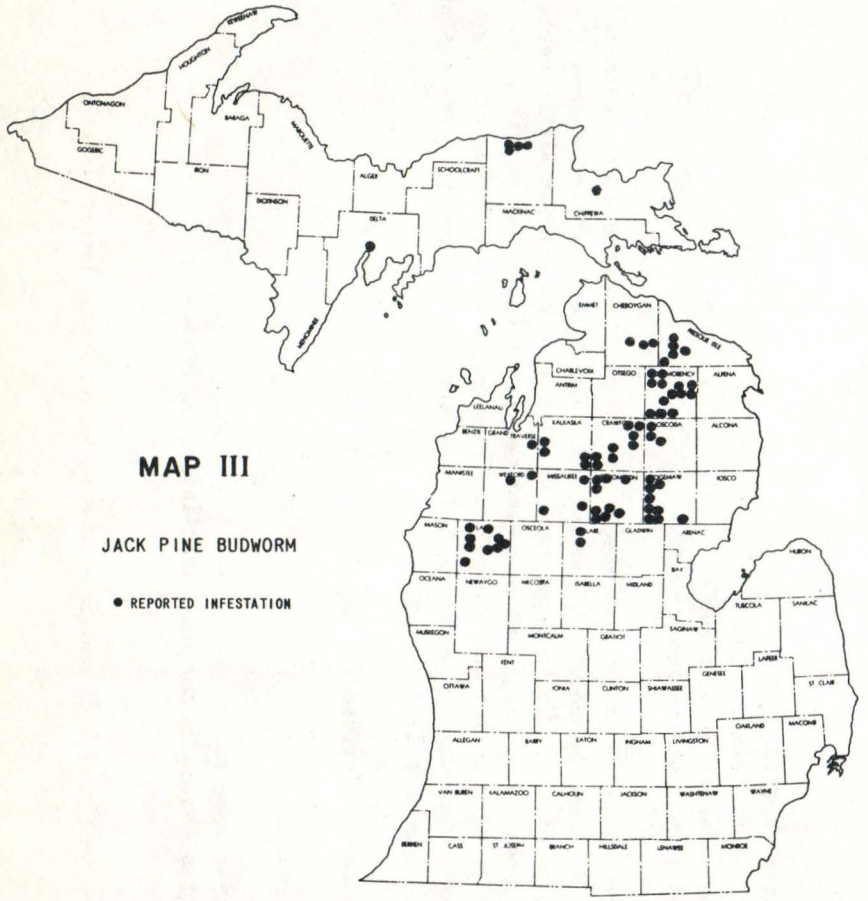
Slightly increased activity by this insect was apparent in the state, especially in the Upper Peninsula. Northern Schoolcraft and northeastern Alger counties showed the greatest concentration of populations. Up to 80 per cent defoliation was evident within certain forest plantings in this area. Highway plantings were heavily infested at points along U.S. 2 in Schoolcraft and Chippewa counties and along U.S. 31 in Emmet county. Four attacks, all in the Lower Peninsula, were reported on jack pine. The balance of the positive reports showed attacks to red pine. (See Map IV.)

LARCH SAWFLY (*Pristophora erichsonii,* Htg.)

Total 137 reports -

62 positive reports.
All reports showed 20 per cent defoliation or less.

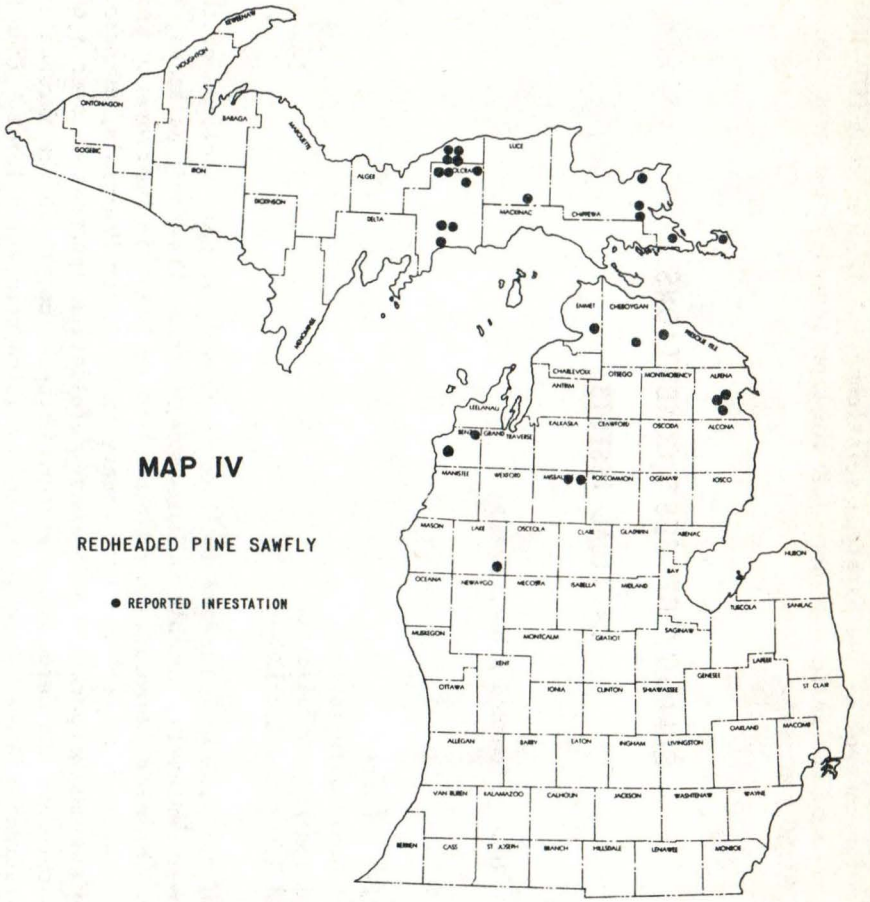
* DATA RECEIVED FROM THE U.S. FOREST SERVICE AND THE MILWAUKEE FOREST INSECT LABORATORY.



MAP III

JACK PINE BUDWORM

● REPORTED INFESTATION



MAP IV

REDHEADED PINE SAWFLY

● REPORTED INFESTATION

Although nowhere in the state was serious injury apparent, this pest was found more abundantly in 1953. Small populations were found in every county in the Upper Peninsula with the heaviest infestations in Baraga and Houghton counties. In addition, the insect was detected in four tamarack sites in Manistee county in the Lower Peninsula. These represent the first recent detection of this sawfly in this part of the state. (See Map V.)

EUROPEAN PINE SHOOT MOTH - (*Rhyacionia buoliana*, Schiff.)

Total 119 reports -

56 positive reports
8 showed heavy injury
14 showed moderate injury
34 showed light injury.

Injury attributable to this serious pest increased perceptibly during 1953. There appears to be a rather uniform spread of populations with heavy injury occurring only locally throughout its distribution. Confirmation of the species in Benzie and Grand Traverse counties was made during the season and further surveys indicated a serious outbreak in this area. This outbreak area is approximately 60 miles north of the limits of infestation established in 1951 and 1952, and is apparently made possible by the warming influence of Lake Michigan and the moderate minimum temperatures of the past two winters. This is thought to be true also of the infestation in Alcona county. (See Map VI.)

SARATOGA SPITTLEBUG - (*Aphrophora saratogensis*, Fitch)

Total 164 reports -

56 positive reports
5 showed heavy injury
5 showed moderate injury
46 showed light injury.

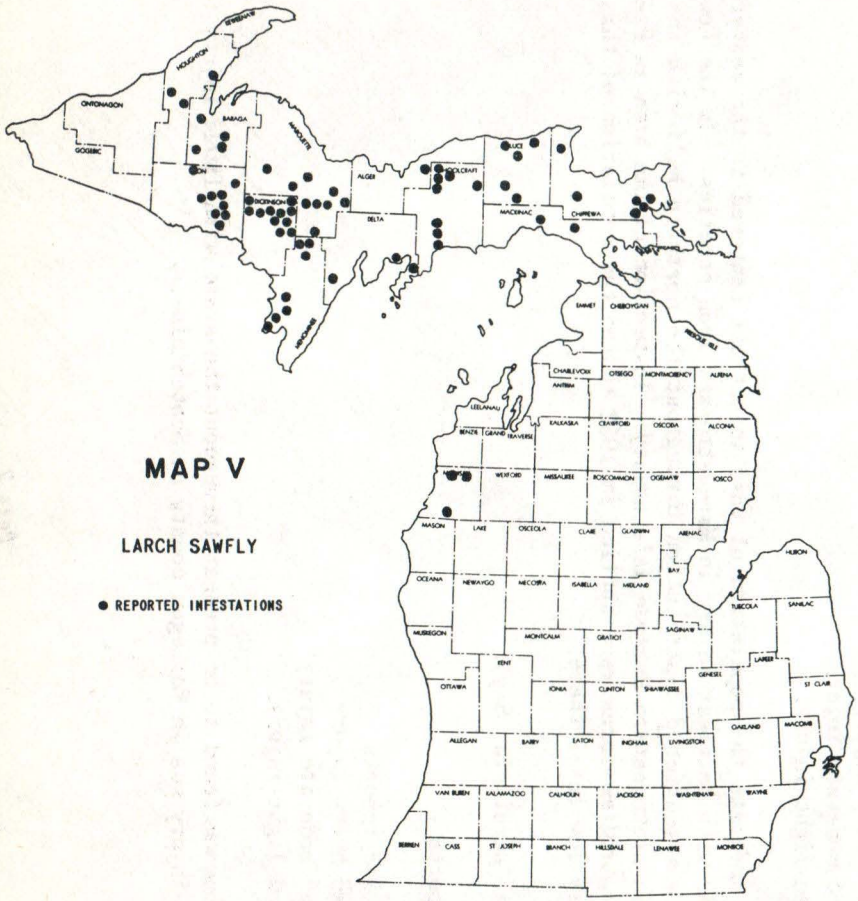
Observations indicate the population of this insect are centered in the western part of the Upper Peninsula with heaviest injury in Marquette and Iron counties. In the Lower Peninsula, reports show a scattered distribution throughout the northern half with the greatest damage occurring in southwestern Presque Isle county. Inspection of the area in Presque Isle county in which control measures were applied in 1952 showed the population of this spittlebug to be at a very low level there.

PINE SPITTLEBUG (*A. parallela*, Say).

Total 187 reports -

87 positive reports
2 showed heavy injury
2 showed moderate injury
83 showed light injury.

This spittlebug was found to be present throughout the state with little injury resulting. Heaviest apparent injury was in Muskegon county on Scotch pine.


MAP V
LARCH SAWFLY
● REPORTED INFESTATIONS

MAP VI
EUROPEAN PINE SHOOT MOTH
● REPORTED INFESTATIONS

WHITE PINE WEEVIL - (*Pissodes strobi*, Peck)

Total 231 reports -

133 positive reports
20 showed heavy attack
21 showed moderate attack
92 showed light attack

Populations of this insect dropped slightly this year. However, it is still very common throughout all but the extreme southeastern and south-central part of the Lower Peninsula. Injury again was heavy in highly susceptible stands with over 60 per cent of the terminals attacked in local areas of Dickinson, Mackinac, Emmet, Otsego, Lapeer, and Allegan counties. Two reports, one from Wexford and one from Emmet county, showed injury to red pine. The remainder of the reports indicated the attack of white, jack and Scotch pine.

ANOMALA BEETLE - (*Pachystethus oblivia*, Horn)

Total 236 reports -

76 positive reports
8 showed heavy defoliation
19 showed moderate defoliation
49 showed light defoliation.

Although over-all populations of the anomala beetle declined slightly, feeding injury was more severe than in 1952. Kalkaska, Benzie, Grand Traverse, and Montmorency counties suffered up to 100 per cent defoliation of both old and new foliage in certain open-grown jack pine stands. Light feeding occurred on red pine in these areas also. The insect has not been detected as yet in the Upper Peninsula.

LARCH CASEBEARER - (*Coleophora laricella*, Hbn.)

Total 125 reports -

99 positive reports
2 showed heavy defoliation
12 showed moderate defoliation
85 showed light defoliation.

Injury by the larch casebearer dropped an average of nearly 30 per cent in the state as a whole. Many areas were nearly devoid of injury this year even though populations were high in these areas in 1952. Heaviest defoliation was found locally in Dickinson, Schoolcraft and Kalkaska counties. Observations also indicated more injury in the widely scattered pockets of of tamarack in the southern part of the Lower Peninsula than in previous years. No further studies of the distribution of the parasite (*Agathis pumilis*, Ratz.) attacking the casebearer were made in 1953.

EUROPEAN PINE SAWFLY - (*N. sertifer*, Geoff.)

Total 85 reports -

63 positive reports
5 showed heavy defoliation
6 showed moderate defoliation
52 showed light defoliation.

A general increase in over-all populations of this sawfly was reported in Christmas tree plantations throughout the southern part of the Lower Peninsula. Reports from Ingham county showed the heaviest injury.

No further disseminations were made of the virus disease affecting the larvae of the European pine sawfly. Although examinations of the treated areas were conducted during May, no evidence of a hold-over of the virus was found. (See 1952 report.)

FOREST TENT CATERPILLAR - (*Malacosoma disstria,* Hbn.)

See Special Surveys.

MISCELLANEOUS INSECTS

BIRCH SKELETONIZER - (*Bucculatrix canadensisella,* Chamb.)

A general epidemic of this insect occurred throughout most areas in the northwestern part of the Lower Peninsula and the western part of the Upper Peninsula. Complete defoliation was encountered late in the season in many areas where birch occurred in abundance, especially in Dickinson, Charlevoix, Antrim, and Grand Traverse counties.

BIRCH LEAF MINER (probably *Fenusa pusilla,* Lep.)

Serious injury resulting from attack by this insect was encountered in northern Luce county in the vicinity of Muskallonge Lake. Several square miles exhibited complete browning of the foliage.

EASTERN TENT CATERPILLAR - (*Malacosoma americana,* F.)

Although defoliation continued to be heavy, the outbreak of this insect declined somewhat throughout the northern part of the Lower Peninsula, especially in Missaukee, Kalkaska and Grand Traverse counties.

JACK PINE SAWFLY - (*N. banksianae,* Roh.)

This sawfly was reported from eight observation areas in 1953. One of these areas, in small saw-log jack pine stands in northeastern Gladwin county, has been reported in previous years and is declining slightly in intensity. There is also a center of population in central Alpena county that is apparently building up. A serious local outbreak was detected in sapling and pole-sized jack pine stands near the north end of Houghton Lake in Roscommon county, with over 90 per cent defoliation resulting.

DISEASES

OAK WILT

Aerial surveys for oak wilt disease were continued in the summer of 1953, making this the third year of surveys since the disease was first confirmed in this state in 1951. Last summer's surveys covered 16 new counties, extending to the north lines of the counties from Oceana to Bay, into the Thumb counties, and those along the extreme southeastern side of the state. Surveys have now covered the entire south half of the Lower Peninsula, and in addition several counties have been resurveyed.

Nine of the 16 northerly counties surveyed during the past summer were flown at six mile intervals giving only a small sample of the area. This was felt to be enough in view of the fact that the intent was to determine northern limits of the disease, and none had previously been reported in these counties. In other counties, flights covered only oak areas which were limited in extent. A total of 65 flying hours was required on 13 days to cover the areas scheduled. A Conservation Department plane was used, at a cost of $452.27 for plane and pilot.

For the first time a full-time man was employed to work on oak wilt survey and control. Employed by the Bureau of Plant Industry of the State Department of Agriculture, he worked with Conservation Department district foresters and Plant Industry inspectors checking suspected locations and contacting owners regarding removal of diseased trees.

Relatively few samples were sent to the Oak Wilt-Dutch Elm Disease Laboratory at Michigan State College for culturing, as it was felt that field personnel were now experienced enough to make positive identification on the ground in most cases.

As a result of the 1953 aerial and supplemental ground surveys, 46 new oak wilt locations were found, and several counties added to the list of those known to have the disease. The new counties were: Branch, Monroe, Ingham, Ionia and Livingston. The disease, however, was not found north of where it was known to exist a year ago. (See Map VII.)

Of the 46 new cases found, only nine were initial infections. The remainder showed evidence that the disease had been present from two to seven years. Infected trees were also found at 39 out of 88 old sites rechecked where the spread was presumably by root grafts.

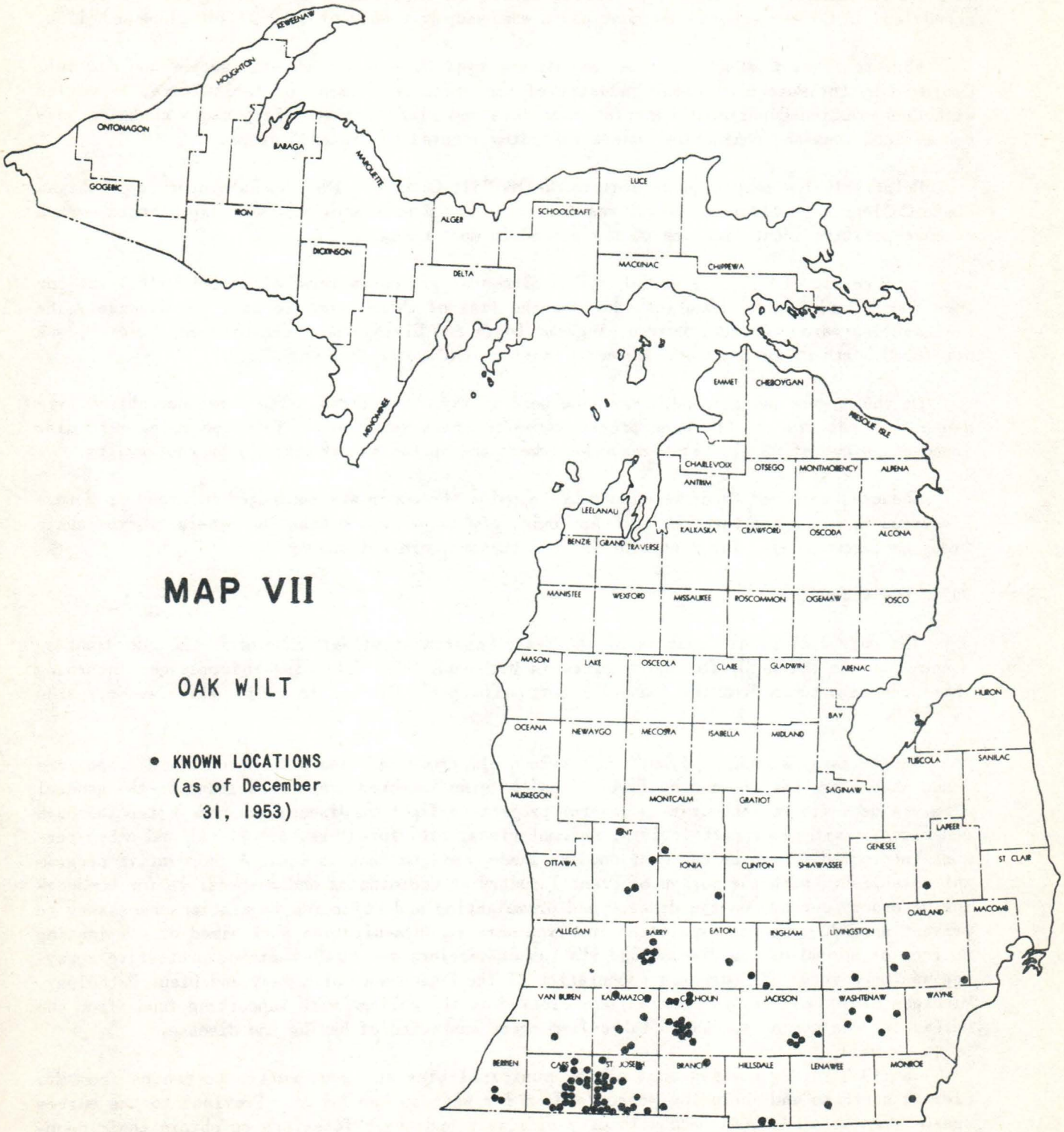
Whenever infected trees were found in a woodlot the owner was contacted and urged to remove his trees within a two-week period. Approximately two-thirds of the landowners removed their trees as recommended. The rest, for various reasons, did not comply.

DUTCH ELM DISEASE

The Bureau of Plant Industry of the State Department of Agriculture is the coordinating agency for the Dutch Elm Disease program in Michigan. The following information concerning this program is taken from the "Annual Report on Dutch Elm Disease in 1953", which was prepared by the Bureau.

In the early summer of 1950, two American elm trees infected with Dutch Elm disease were found in eastern Detroit and by fall a total of nine infected trees were found in the general area. A decision to inaugurate a control project to fight the disease was made after thorough consultation with plant pathologists, entomologists, city foresters, arborists, and other persons interested in saving our most popular shade tree from destruction. A cooperative program was established with the Bureau of Plant Industry as coordinator and responsible for conducting necessary surveys on the disease and promulgating and enforcing regulations necessary to prevent spread. The municipalities involved were to do sanitation work aimed at eliminating sources of spread of the disease and its insect carriers and to do whatever protective spraying was necessary. Through the cooperation of the Department of Botany and Plant Pathology, Michigan State College, a laboratory was created at the college with supporting funds from the Bureau for diagnosing specimens taken from trees suspected of having the disease.

The 1953 survey covered most of the municipalities and some entire townships from Mt. Clemens south to and including Monroe and as far west as Ann Arbor. Previous to the survey season, contacts had been made with city officials and their foresters to obtain their cooperation. Elm trees on both private and public property were surveyed with samples of wood from trees suspected of being diseased being sent to the laboratory. If diagnosis showed the tree to be infected, a condemnation notice was delivered to the owner requesting the removal of the tree within ten days.



MAP VII

OAK WILT

- **KNOWN LOCATIONS (as of December 31, 1953)**

During the season, in the nine-county area in southeastern Michigan, over 900,000 trees were examined. Samples from 1,924 trees were received by the laboratory, of which 1,218 trees were diagnosed as infected. Of these diseased trees, 1,086 have been destroyed.

The Parks and Recreation Department of the City of Detroit has been a leader in control work and during 1953 spent over $41,000 in spraying elm trees for protection against the Dutch Elm disease. The City of Flint has carried on a thorough sanitation program since three diseased trees were found there in 1952 and it is noteworthy that two complete surveys of the city this past summer did not reveal any new cases of the disease. Other municipalities that have been doing control work for a year or more have reduced the rate of spread of the disease.

Looking forward to 1954, it is evident and necessary that the Bureau of Plant Industry expand its survey operations and that the laboratory facilities at Michigan State College be enlarged.

PLANS FOR 1954

Plans for the Michigan Forest Pest Detection Program for 1954 include the following major projects:

(1) Reconnaissance survey of the jack pine budworm infestation in Luce county.

(2) Instigate silvicultural control measures in budworm-infested stands in Luce county.

(3) Aerial survey of forest tent caterpillar defoliation in both peninsulas.

(4) Continue forest tent caterpillar egg mass and parasite studies and surveys.

(5) Continued cooperation with private individuals and groups in technical advice on forest tent caterpillar control.

(6) Special larch sawfly detection survey in the Lower Peninsula.

(7) Reconnaissance survey of walkingstick infestations in Ogemaw, Crawford, and Dickinson counties.

(8) Renew European pine sawfly virus disease studies.

(9) Reconnaissance and appraisal surveys of redheaded pine sawfly infestations in the Grand Sable State Forest.

(10) Continue efforts to enlist private forest industry cooperation in the Michigan Forest Pest Detection Program.

(11) Intensification of oak wilt survey in most heavily infected areas, with greater emphasis on prompt removal of infected trees.

(12) Studies of tree mortality caused by various insects on the critical list.

SUMMARY

During the 1953 season, 1,942 observation reports were received, an increase of 572 over the previous year. Fifty new permanent observation areas were added, bringing the total to 609.

Five special insect surveys were conducted. Three of these were made to study the progress of the forest tent caterpillar outbreak, including an aerial survey to locate the boundaries of defoliated areas, a cocoon mortality survey to determine the percentage of cocoon parasitism and death from other factors, and an egg mass survey to determine the location and approximate population densities for 1954. The other surveys were carried out to locate the extent of the jack pine budworm populations in northern Luce county and to determine the distribution of the larch sawfly in the Upper Peninsula.

The Onaway and P. H. Hoeft State Parks were sprayed, using a mist blower, for suppression of the forest tent caterpillar. Other direct control projects included a cooperative aerial project between private owners and the Soil Conservation Service against the European pine shoot moth, and aerial operations for Saratoga spittlebug control on the Ottawa and Hiawatha National Forests.

The jack pine budworm outbreak declined in the Lower Peninsula, with highest populations remaining in Presque Isle and Montmorency counties. The outbreak in Luce county in the Upper Peninsula extended to over 6,000 acres.

The larch sawfly was detected in every county in the Upper Peninsula and in four areas in Manistee county in the Lower Peninsula.

The forest tent caterpillar occurred in epidemic numbers over 1,400,000 acres in the state. Surveys indicate a decline in populations in the eastern end of the Upper Peninsula and an increase in populations in the Lower Peninsula.

As a result of 1953 surveys for oak wilt, 46 new cases were found, bringing the total to 103.

Dutch elm disease surveys, supervised by the State Department of Agriculture, included nine counties in southeastern Michigan. Over 900,000 trees were examined and 1,218 trees were diagnosed as infected.

* * *